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What is claimed:

1. A method for creating a layout control system that can execute proportional commands, comprising; providing a control input means, connecting to a command station means that can accept and process proportional commands and that encodes
1845 said proportional commands into a track control waveform, communicating with a train layout and a decoder device means attached thereto, whereby the upgrading of said control input means to a new proportional control capability configures said layout control system for proportional control of an effect.
2. The method of Claim 1 wherein said track control waveform is a digital bipolar
1850 square-wave waveform and is a member of the group of digital control waveforms comprising, NMRA DCC, Marklin Trinary, Trix, FMZ and Zimo.
3. The method of Claims 1 or 2 wherein the connection of control input means to said command station means is by a multiple-access capable bi-directional system data network means.
- 1855 4. The method of Claim 3 with the addition of a layout detection system means for bi-directional data exchange with said decoder device means allowing display and recall of state information from any user interface display means communicating with said multiple-access capable bi-directional system data network means.
5. The method of Claim 4 wherein said layout detection system means employs the art
1860 of US Patent Number 6,220,552.
6. The method of Claim 3 wherein said control input means is a manual input device means such as a throttle means.
7. The method of Claim 3 wherein said control input means is a computer means.
8. The method of Claim 1 wherein said control input means is a manual input device
1865 means such as a throttle means.
9. The method of Claim 1 wherein said control input means is a computer means.
10. The method of Claim 7 or 9 wherein said computer means is also connected to an Internet means.

11. The method of Claim 1 wherein said decoder device means has the added capability
1870 of configuring general purpose function lead means as a synchronous data connection
means to an external expansion module means.
12. The method of claim 11 wherein said external expansion module means uses said
synchronous data connection means for synchronization and control of a sound
generator means.
13. The method of claim 12 wherein said control of a sound generator means includes the
1875 ability to modify sound pitch and volume in response to motor load and speed
information means conveyed by said synchronous data connection means.
14. The method claim 11 wherein said synchronous data connection means has the added
capability of conveying a proportional command.
15. The method claim 14 wherein said proportional command allows the proportional
1880 control of an aspect of a sound generator means.
16. The method claim 15 wherein said proportional control of an aspect of said sound
generator means includes a member of the following group; Doppler effect simulation
with variable rate of pitch change, sound pitch, sound volume, sound repetition rate,
1885 sound duration, sound echoes, sound reverberation and number of sound events.
17. The method of claim 13 wherein said motor load and speed information means
configures the continuous variation and compaction of a long steam chuff in response
to train load and speed.
18. The method of Claim 11 with the addition of an additional track power connection
1890 means to allow direct decoding of track commands.
19. The method of Claim 1 wherein said decoder device means has the added capability
of controlling a proportional light effect aspect in response to a proportional
command.
20. The method of Claim 1 wherein said control input means is a manual input device
1895 with a proportional key means and a binary key means arranged to provide a
proportional control means that can be latched at a value that is other than the resting
state.
21. The method of Claim 1 wherein said control input means is a manual input device
means with a multiplicity of key means of which at least one has proportional

- 1900 capability arranged to provide the selection and control of a multiplicity of proportionally controllable aspects of an effect.
22. The method of Claim 1 wherein said control input means is a manual input device means with the addition of a binary key means and a filter means that provides for a lower sensitivity proportional control.
- 1905 23. The method of Claim 22 with the addition of a proportional key means to further improve said lower sensitivity proportional control.
24. The method of Claim 3 wherein said connection to said multiple-access capable bi-directional system data network means is conveyed on an bi-directional RF data link means that permits said control input means to access, control and display all network data exchanges including, proportional commands, bi-directional data and position information with said decoder device means.
- 1910 25. The method of Claim 24 wherein said RF link means employs a frequency agile RF transceiver means that can be configured to recognize and send RF data to a less capable RF link means.
- 1915 26. The method of Claim 25 wherein said frequency agile RF transceiver means is configured to form a frequency hopping RF data link means.
27. The method of Claim 26 wherein said frequency hopping RF data link means is configured to provide selection between a primary hop sequence means and at least one secondary hop sequence means for expanded data exchange capability.
- 1920 28. The method of Claim 27 wherein said at least one secondary hop sequence means is configured to directly control a decoder means with an attached RF transceiver means.
29. The method of Claim 28 wherein said decoder with an attached RF transceiver means employs a backup battery means to allow operation without track power.
- 1925 30. The method of Claim 29 wherein said backup battery means can be charged upon the provision of track power.
31. The method of Claim 27 wherein said secondary hop sequence means is timed to operate in synchrony with said primary hop sequence means to avoid interference.

- 1930 32. The method of Claim 27 wherein said at least one secondary hop sequence means is configured to allow exchange of multimedia and voice communication with any other RF transceiver means employing a matching hop sequence means.
33. The method of Claim 26 wherein said frequency agile RF transceiver means is configured by a control sequencing logic means to create a consistent data interface means.
- 1935 34. The method of Claim 24 wherein said RF link means employs frequency modulation to provide FM capture effect and enhanced space diversity.
35. The method of Claim 24 wherein said RF link means employs an embedded system identifier (ID) means to identify the desired layout for control and allow the routing of commands and data to the appropriately identified system.
- 1940 36. The method of Claim 2 with the addition of a phase-encoded digital bipolar square-wave means that is interleaved with any said member of the group of digital control waveforms to provide an expanded high speed control capability.
37. The method of Claim 36 with the addition of a predefined training pattern means configured for a decoder means to determine pulse timing distortion.
- 1945 38. The method of Claim 36 wherein said high speed control capability allows multimedia data and programming data to be sent over the tracks to a sound generator means.
39. The method of Claim 2 with the addition of a RF digital control signal means to provide an expanded control capability.
- 1950 40. A method for improving a track control system comprising; providing a command station means that encodes commands into a digital track control waveform that is a bipolar square-wave waveform and is a member of the group of digital control waveforms comprising, NMRA DCC, Marklin Trinary, Trix, FMZ and Zimo, and adding a RF digital control signal means to said digital track control waveform,
- 1955 whereby an expanded control capability is created.
41. The method of Claim 39 or Claim 40 wherein said RF digital control signal means employs a modulation means that is a member of the group of Amplitude modulation, Frequency modulation, Phase modulation, QPSK modulation, Trellis coded

- 1960 modulation, Gaussian mean shift keying modulation and direct sequence spread spectrum modulation.
42. The method of Claim 41 wherein said modulation means is mixed onto a frequency agile carrier means.
43. The method of Claim 41 with the addition of directional coupler means to allow the localization and detection of position for a decoder means responding to said RF digital control signal means.
- 1965 44. The method of Claim 10 wherein said computer means that is also connected to an Internet means is configured to provide a TCP/IP Web server interface means that allows an Internet connected information appliance means to access said layout control system with a Browser software means.
- 1970 45. An apparatus that can be expanded for proportionally controlling aspects of functions on a layout control system comprising; a control input means that is capable of bi-directional untethered operation and with a key control means and a user interface display means to display status and position feedback of a decoder device with functions means, connected to, a multiple-access capable bi-directional system data network means, a command station means that can accept and process proportional commands from said multiple-access capable bi-directional system data network means and that encodes said proportional commands into a track control waveform means conducted to a train layout means, said decoder device with functions means attached thereto, whereby the addition of a proportional command generating means
- 1975 to said control input means configures said layout control system for proportional control of said decoder device with functions means.
- 1980 46. The apparatus of Claim 45 with the addition of a computer means connected to an Internet connection means that is configured allow the upload and download of control software microcode means and diagnostic information means to any device
- 1985 that is controllable with bi-directional data exchange capability from said multiple-access capable bi-directional system data network means.
47. The method of Claim 10 wherein said computer means that is also connected to an Internet means is configured to allow the upload and download of control software microcode means and diagnostic information means to any device that is controllable

- 1990 with bi-directional data exchange capability from said multiple-access capable bi-directional system data network means.
48. The method of claim 11 with the addition of a motor load and speed information means that configures said decoder means for scalable speed stabilization of the speed of a motor means.
- 1995 49. The method of claim 48 with the addition a droop CV adjustment means for controlling said scalable speed stabilization of the speed of a motor means.
50. The method of claim 48 with the addition a cam timing input means on a sound generator means for controlling said scalable speed stabilization of the speed of a motor means.
- 2000 51. An apparatus for conveyance of proportional commands for control in a layout control system comprising; a control input means with a proportional key control means to generate proportional commands and a user interface display means to display status and position feedback of a decoder device with functions means and a RF transceiver with a frequency hopping capability that forms a bi-directional RF
- 2005 data link with, a second RF transceiver with a frequency hopping capability connected to, a multiple-access capable bi-directional system data network means, a command station means that can accept and process proportional commands from said multiple-access capable bi-directional system data network means and that encodes said proportional commands into a track control waveform means conducted
- 2010 to a train layout means, said decoder device with functions means attached thereto, whereby said bi-directional RF data link configures said control input means for proportional control of said decoder device with functions means with an untethered connection. .
52. A method of creating a manual input device with a proportional key capability,
- 2015 comprising; providing a multiplicity of key means of which at least one has proportional capability, arranging said keys to provide the selection and control of a multiplicity of proportionally controllable aspects of an effect.
53. A method of creating a manual input device with a proportional key capability, comprising; providing a soft key means and a key means of which at least one has

- 2020 proportional capability, arranging said keys to provide the selection and control of a multiplicity of proportionally controllable aspects of an effect.
54. The method of Claim 52 or 53 with the addition of a further arrangement to provide a proportional control means that can be latched at a value that is other than the resting state
- 2025 55. The method of Claim 52 or 53 wherein a binary key means and a filter means creates said proportional key capability.
56. The method of Claim 52 or 53 with the addition of a filter means to lower sensitivity of said proportional control.
57. A method of creating a manual input device with a proportional key capability,
- 2030 comprising; a speed knob means and, a binary key means arranged to provide a proportional control means that can be latched at a value that is other than the resting state.
58. The method of Claim 55 with the addition of at least one more key means to provide the selection and control of a multiplicity of proportionally controllable aspects of an
- 2035 effect.
59. An apparatus with a proportional key capability, comprising; a proportional key means and, a binary key means arranged to provide a proportional control means that can be latched at a value that is other than the resting state.
60. The method of claim 3 with the addition of a record key means on said control input
- 2040 means that permits the editing and storage of control commands in a device connected to said multiple-access capable bi-directional system data network means.